Obstacles and Perspectives

EES 3310/5310

Global Climate Change

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Class #39: Friday, April 17 2020

Announcements

Announcements

- Finishing the Semester:
  - If you have incomeplete work for labs and are planning to finish and submit, please email Ms. Best to let her know
  - The final exam will be optional:
    - Open book, open notes essay exam.
    - Will be distributed Monday April 20
    - Due Wednesday April 29
    - Submit by email to Professor Gilligan
    - If you choose not to do the exam, I will give you a grade based on labs, midterm exam, and participation:
      - Participation 5%
      - Mid-term 35%
      - Labs 60%
    - If you do the exam, the ***minimum grade*** you get will be what you would have gotten based on work before the exam
      - i.e., if you choose to do the exam, it ***cannot*** make your grade lower.

Obstacles to Climate Policies

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Nordhaus's Version:

1. Prisoners of Nationalism
2. Prisoners of the Present
3. Prisoners of Partisanship
4. Prisoners of Self-Interest

Game Theory: Nationalism and Prisoner's Dilemma

Free Riding: Five Countries

Tons Abated	Marginal Cost (One Country)	Marginal Benefit (All Countries)	Cumu-lative Cost (One Country)	Cumu-lative Benefit (All Countries)
1	3	25	3	25
2	6	25	9	50
3	9	25	18	75
4	12	25	30	100
5	15	25	45	125
6	18	25	63	150
7	21	25	84	175
8	24	25	108	200
9	27	25	135	225
10	30	25	165	250

- Five Countries
  - Benefits for each ton of abatement by anyone:
    - Each country: $5
    - World: $25 ($5 for each of 5 countries)
  - Optimum:
    - What is the optimum abatement?
    - Optimum abatement is 8 tons from each country

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7	21	25	84	175
8	24	25	108	200
9	27	25	135	225
10	30	25	165	250

- If everyone abates 8 tons:
  - Each country pays $108
  - Total abatement = $5 \times 8 \text{ tons} = 40 \text{ tons}$
  - Each country benefits $40 \times \$5 = \$200$
  - Net benefit for each country: $92
  - Net benefit for World: $\$92 \times 5 = \$460$

Free Riding: Five Countries

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8	24	25	108	200
9	27	25	135	225
10	30	25	165	250

- If everyone abates 8 tons:
  - Each pays $108, benefits $200
  - Net benefits:
    - $92 for each country,
    - $460 for the world
- Four abate 8 tons, one abates 1 ton
  - Four pay $108, one pays $3
  - Total abatement = 33 tons
  - Each country benefits $33 \times \$5 = \$165$
  - Net benefits:
    - 4 countries get $57 ($35 worse off),
    - One gets $162 ($70 better off),
    - World: $390 ($70 worse off).

Free Riding: Five Countries

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6	18	25	63	150
7	21	25	84	175
8	24	25	108	200
9	27	25	135	225
10	30	25	165	250

- If everyone abates 8 tons:
  - Net benefits:
    - $92 for each country,
    - $460 for world.
- 4 abate 8 tons, one abates 1 ton
  - Four countries are $35 worse off,
  - 1 is $70 better off.
  - World is $70 worse off
- 5 countries each abate 1 ton
  - Each country pays $3, benefits $25
  - Net benfits:
    - Each country: $22 ($70 worse off)
    - World: $110 ($350 worse off)

Free Riding: Five Countries

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2	6	25	9	50
3	9	25	18	75
4	12	25	30	100
5	15	25	45	125
6	18	25	63	150
7	21	25	84	175
8	24	25	108	200
9	27	25	135	225
10	30	25	165	250

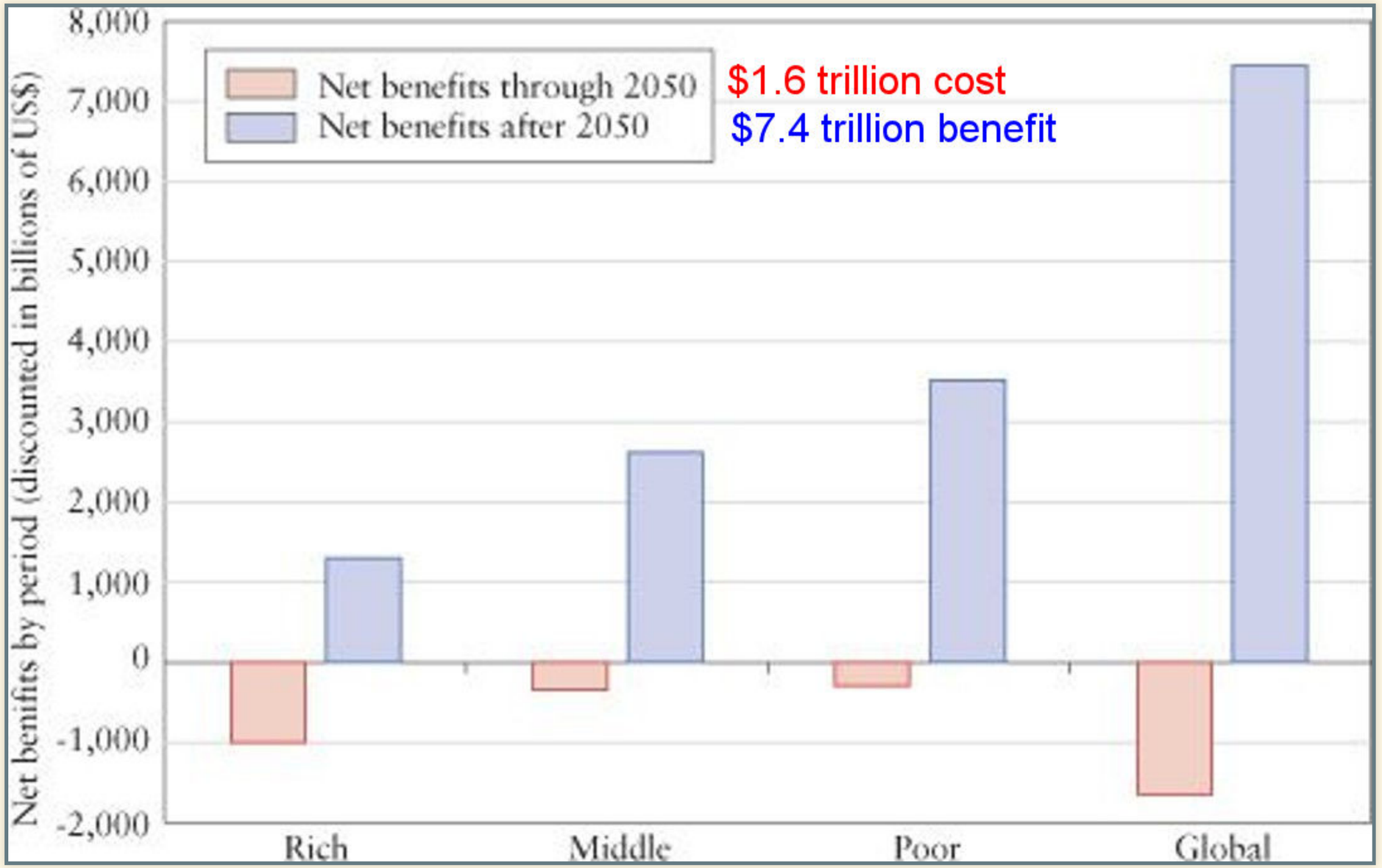
- 5 countries each abate 1 ton
  - Net benefits:
    - Each country: $22
    - World: $110
- 4 abate 1 ton, one abates 2 tons
  - 4 pay $3, 1 pays $9
  - Each country benefits $30
  - Net Benefits:
    - 4 countries: $27 ($5 better off)
    - One country: $21 ($1 worse off)
  - World: $129 ($19 better off)
  - Abating the extra ton helped everyone except the country that did it.

Nash Equilibrium

- If everyone does the same thing, everyone is best off cutting 8 tons
- If everyone else cuts 8 tons, I am best off cutting 1 ton
- No matter what everyone else does, I am better off cutting 1 ton
- If everyone does what is best for themself, everyone is worse off than if everyone cooperates
- “Prisoner’s dilemma”

Prisoners of the Present

Myopia and Temporal Tradeoffs

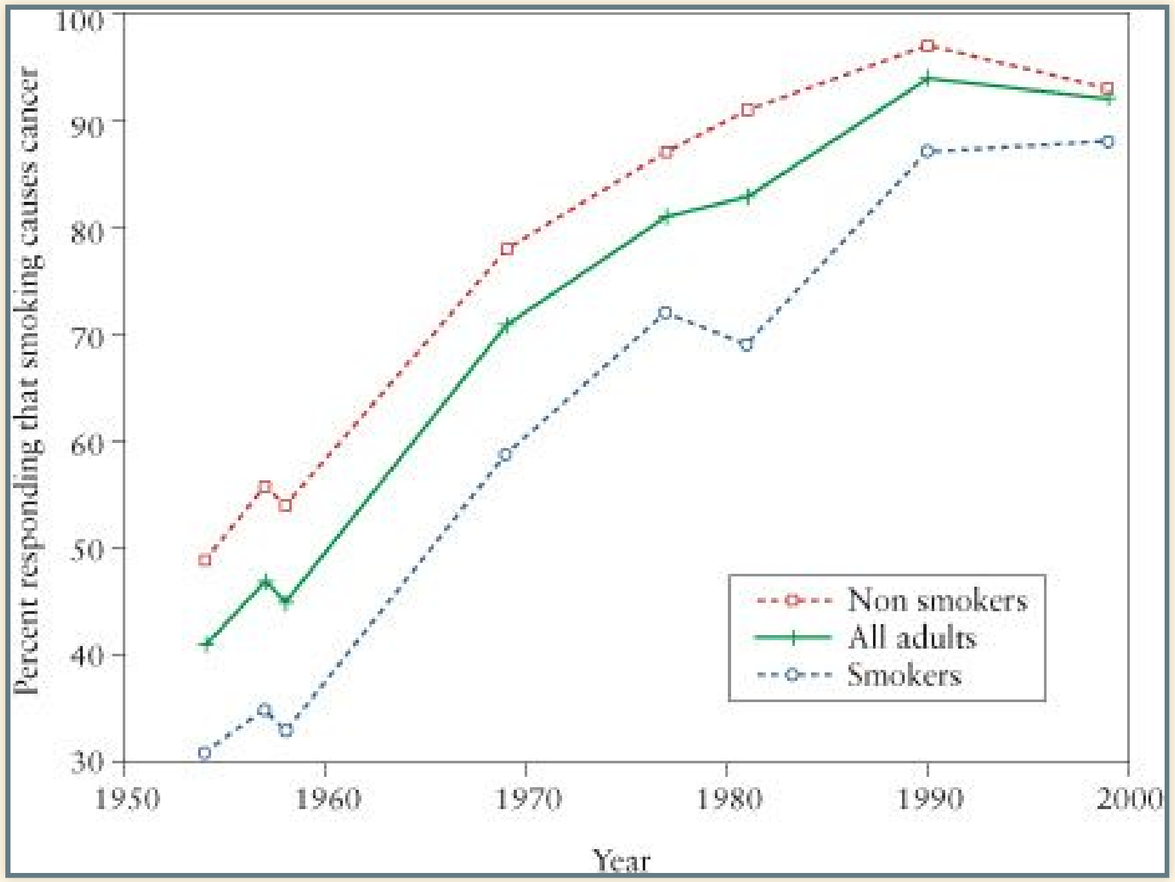


Prisoners of Partisanship and Self-Interest

Politics

- Partisanship:
  - 4,000 coal mining jobs in economy with 140 million jobs
- Merchants of Doubt:
  - Industry spending on misinformation
  - Compare to tobacco:
    - $30 billion/year tobacco industry
    - $1000 billion/year energy industry

Merchants of Doubt



- You can’t fool all of the people all of the time
- Compare carbon taxes to tobacco taxes

Krugman on Nordhaus

Historical Perspective

- **Early Nordhaus:**
  - Debunker
  - Emphasized high discount rates
  - Estimated relatively small damages from warming
  - Conclusion: No rush to decarbonize, do it slowly and cheaply
- **Later Nordhaus:**
  - Every assessment increases estimates of damage:
    - More urgency: spend more, decarbonize faster
  - Discount rates don’t matter as much as he used to think
  - Unmanageable Systems
    - Conclusion: Keep warming from going much above 2°C

Krugman's Criticisms

- Nordhaus emphasizes carbon pricing
  - Economically this is about balancing multiple factors
  - But one factor is dominant: coal-fired electricity
  - When one factor dominates, stronger case for command-and-control regulation
- Policy target:
  - Criticizes (debunks) 2°C target: "Not very scientific"
  - But concludes optimum target is around 2.3°C
- Big picture:
  - Will *The Climate Casino* change anyone's mind?